## REMARKS/ARGUMENTS

The present application has been carefully reviewed in light of the June 6, 2005 Office Action. In that Office Action, claims 1-30 were rejected under 35 U.S.C. § 102(e). In response, Applicants have canceled claims 1-13 and 27-30, amended claims 14-16, 18-21, and added new claims 31-45. Based on these amendments, and the following arguments, Applicants respectfully request reexamination and reconsideration of the application.

TIME EXTENSION

Submitted herewith is a three-month time extension request, and pertinent fee.

CLAIM REJECTIONS

Claims 1-30 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Pruthi (U.S. Publication No. 2004/0015582). This Publication has the PCT filing date of May 12, 2001, and claims priority to a provisional application filed on May 12, 2000. The present application was filed on November 28, 2001, and is a continuation-in-part of United States Application Serial No. 09/727,377, filed November 28, 2000. This application claimed priority to prior foreign reference application 005366, filed April 27, 2000 in France. Applicants submit herewith as Exhibit A the Declaration and Power of Attorney for Patent Application filed in the 09/727,377 application. Attached hereto as Exhibit B is a photocopy of the cover page of the issued French Patent No. 2,808,345-B1. Under 35 U.S.C. § 119, the present application obtains the benefit of the previously filed French application as the corresponding U.S. application was filed less than twelve months after the French filing date. Thus, the present application has a priority date of April 27, 2000, which predates the earliest priority date of the cited Pruthi reference. Thus, Applicants respectfully submit that the Pruthi reference should be withdrawn from consideration.

However, there are significant differences between the Pruthi reference and the invention. Pruthi is directed to a security camera for a network. In one embodiment, Pruthi discloses a system and method of calculating the

one-way delay for data traveling from a first communication line to a second communication line (see Pruthi paragraphs 0073-0088). The Pruthi method synchronizes clocks of two network monitors, or computers. This is done by receiving a time signal from a common time source, such as a system of global position satellites (GPS). Each network monitor includes a receiver for receiving a time signal from one or more global satellites. One network monitor includes a master GPS receiver and the other includes a slave GPS receiver coupled to the master. The network monitor consists of a host computer having an interface computer on a network interface card coupled to the communication line it is monitoring. The interface computer associates a time of receipt with the data, or time stamps the data. The interface computer includes an interface clock which is synchronized with the host computer clock. As each packet is received from the communications line, the current value of the counter or clock of the interface computer is associated with the packet. The packet is later transferred to the host computer with the counter value. It is the host computer's clock which is synchronized with the GPS signal. The host computer periodically requests the value of the interface clock counter from the interface computer, and uses this value to correlate the counter to the host clock. This is done by the host computer computing an estimate of the relative frequency of the interface clock counter to the host computer clock. An interrupt service time is also precomputed which corresponds to the duration of time between when the interface computer receives the counter request from the host to when the interface computer provides the host computer with the adjusted counter value. Thus, the time delay between the host computer and the interface computer is computed and estimated over a sampling of comparisons. This computed estimate is then built into the time delay. Pruthi discloses that the time delay is accurate to approximately ten microseconds.

The present invention is directed to a method for creating accurate time-stamped frames to be sent between computers via a computer network as well. However, the present invention operates in a much different manner than Pruthi.

A universal coordinated time reference signal is received (typically via a global positioning receiver as recited in claims 15, 23 and 35). Clocks electronically connected to the universal coordinated time reference receivers are synchronized. These clocks are associated with sending and receiving computers, but operate independently of the operating system clocks of the sending or receiving computers. The clocks are used to create sub-microsecond time values corresponding to a fractionalized universal coordinated time reference signal. In a particularly preferred embodiment, as recited in claims 18, 23, 33, and 40, a voltage controlled crystal oscillator associated with the clock comprises a counter creating the sub-microsecond time values. In the case of a 25 megahertz voltage controlled crystal oscillator, repetitive ticks are created at 40 nanoseconds or 40 nanosecond intervals. If using a 100 megahertz voltage controlled crystal oscillator, the ticks are spaced apart by only ten nanoseconds.

Over time, the clock is adjusted into synchronization with the universal coordinated time reference signal, which, as known in the art and disclosed in the Specification, is a one pulse per second signal. Thus, for each signal, if there is a drift or error of one or two ticks, the clock is adjusted so as to be re-synchronized with the universal coordinated time reference signal. As recited in claim 18, 23, 33 and 40, voltage applied to the voltage controlled crystal oscillator is altered to speed up or slow down and synchronize the sub-microsecond time values created by the counter on the clock. Thus, the clock itself is adjusted over time, typically each pulse per second of the GPS signal.

A test frame is created, including a tag having reserved fields for transmit and receive time stamps, representing the universal coordinated time reference signal and the sub-microsecond time values created by the counter or clock (collectively, the absolute time value). A transmit time stamp is inserted into the reserved transmit time stamp field according to the time on the synchronized clock of the sending computer (but not the operating system clock) at the instant the test frame is sent on to the network without intervention of the sending computer's central processing unit. As recited in new dependent claim 31, the transmit time stamp is inserted into the reserved

transmit time stamp field at the instant a last byte of the test frame is sent on to the network.

As recited in claims 16, 17, 24, 25, 36 and 37, the clock and global positioning system receiver are electronically connected on a device, such as a card, which is attachable to an existing multi-master bus of the computer. As recited in new claims 32 and 38, the device includes only hardware or firmware and not software, and does not consume any of the computer's central processing resources.

With the foregoing arrangement, the synchronized clocks have a resolution of between 10 and 100 nanoseconds, as recited in claims 22, 26, and 41. Those skilled in the art will appreciate that this is between 100 and 1,000 times more accurate than the 10 microsecond accuracy of the Pruthi device. There are several structural and functional differences between the present invention and the Pruthi method which enables the invention to attain such a high degree of accuracy. Pruthi relies upon a host and interface computer which are connected to one another. There is an inherent time delay between sending the packet of data from the computer through the interface computer. Moreover, Pruthi relies upon the host computer (sending or receiving computer) clock being synchronized with the GPS signal. Thus, there is involvement of the host computer's central processing unit or operating system with the generation and reading of the time stamp. This also creates a delay.

Moreover, Pruthi does not disclose, teach, or even infer that the clock or counter in the interface computer be adjustable. Instead, as the counter or clock in the interface computer drifts from the GPS reference time signal, the host computer computes this difference and makes a corrective computational estimate of this difference, which it deems to be the delay of transmission between the host computer and the interface computer. Over multiple samplings and computations, this value is averaged and estimated.

Furthermore, as disclosed in paragraph 0080 of the Pruthi reference, the calculated network delay may include components due to queuing delay and to transmission delay. This is due to the arrangement of the host and

interface computers. Thus, Pruthi only has an accuracy of approximately ten microseconds.

As discussed above, the present invention in a particularly preferred embodiment comprises a card attachable to an existing multi-master bus of the sending or receiving computer. The card or device includes the universal coordinated time signal receiver (GPS receiver) and the clock or counter. The device operates completely independent of the CPU or operating system, as well as the internal clock of the computer. Moreover, the device includes only hardware or firmware and not software. As the single clock or counter is directly tied into the GPS signal, and there is no interface required between the computer system clock, CPU or operating system with the device, these delays are eliminated. Moreover, the elimination of software further eliminates delay and increased inaccuracies. Pruit teaches the opposite in all cases.

Furthermore, the counter or clock of the present invention is adjusted such that the sub-microsecond time values are synchronized with the GPS universal coordinated time reference signal. As this is preferably done at every pulse per second, drifts of one or two ticks per second can be corrected each second. Thus, increased inaccuracies due to drift over time does not occur with the present invention. This is done, as discussed above, by altering the voltage applied to the voltage controlled crystal oscillator to speed up or slow down the counter or clock. Pruthi simply does not disclose this.

Independent claims 14, 23, and 34 recite inserting a transmit time stamp into the reserve transmit time field the instant the test frame is sent on to the network, without intervention of the sending computer central processing unit. More particularly, new claim 31 recites that the transmit time stamp is inserted at the instant last byte as the test frame is sent on to the network. The Pruthi system and method does not disclose or teach this, and is incapable of doing so due to its configuration.

Independent claim 14 recites receiving the test frame having the transit time stamp and inserting a received time stamp into the reserve receive time stamp field corresponding to the time on the synchronized clock of the receiving computer when the test frame was received by the receiving

computer. Claims 19 and 23 further recite that a receiving device, without intervention from the receiving computer, automatically attaches a receive time stamp corresponding to the synchronized time that the frame was received for each frame received. Claim 20 recites that the tag of each test frame is detected, and receive time stamp corresponding to the synchronized time that the frame was received is attached to only the test frames. Independent claim 13 further recites creating complimentary time information in the reserve transmit and receive time stamp fields, and replacing this complimentary time information with the transit time stamp as well as the receive time stamp. Claims 31 and 42 recite that the receive time stamp is inserted into the reserved receive time stamp field when a first byte of the test frame is received by the receiving computer. With respect to these recitations, Pruthi simply does not disclose such recitations with specificity, but only the insertion of a time stamp in a general manner. Thus, Applicants assert Pruthi does not disclose or teach these recitations.

Anticipation focuses on whether a claim reads on the product or process a prior art reference discloses, not on what the reference broadly "teaches". *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 218 USPQ 781 (Fed. Cir. 1983). For a prior art reference to anticipate in terms of 35 U.S.C. §102, every element of the claimed invention must be identically shown in a single reference. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990). Thus there must be no difference between the claimed invention and the reference disclosure, as viewed by a person or ordinary skill in the field of the invention. *Scripps Clinic & Research Foundation v. Genentech, Inc., 927 F.2d 1565, 18 USPQ2d 1001, 18 USPQ2d 1896 (Fed. Cir. 1991).* Although Pruthi broadly teaches calculating network delay, it does not include every element of the claimed invention and one of ordinary skill in the field of the invention would view significant differences between the claimed invention and the Pruthi reference. Thus, Applicants respectfully assert that currently pending claims 14-26 and 31-45 are not anticipated by Pruthi.

In fact, Pruthi discloses a methodology similar to that disclosed by Applicants on page 5, lines 5-25, in the Background section. Although Pruthi incorporates an GPS or radio clock, as described in the Background section,

this still does not lead to an overall good accuracy, especially considering the increased speed of today's and tomorrow's networks.

Moreover, Applicants respectfully assert that the currently pending claims are not rendered obvious by Pruthi as to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. M.P.E.P. §2143.03 (citing In re Royka, 180 USPQ 580 (CCPA 1974). All words in a claim must be considered in judging the patentability of that claim against the prior art. In re Nomiya et al., 184 USPQ 607, 612-613 (CCPA 1975).

Thus, given the foregoing, Applicants respectfully assert that claims 14-26, and 31-45 are patentably distinct and should be allowed, notice of which is hereby respectfully requested.

Respectfully submitted,

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